

Large areas of the Gatumba Mining District (GMD) in Rwanda are covered by Technosols (pegmatite or pegmatite-soil mixtures) resulting from coltan (Colombite and Tantalite) mining activities. These substrates are very poor in total and available plant nutrient contents and are therefore low in soil productivity. Due to agricultural land shortage in Rwanda, almost all the available land is farmed. The present study was conducted to evaluate the effect of different fertilizers on plant nutrient uptake and biomass production of soybean. A greenhouse pot experiment using pegmatite substrate alone and a pegmatite-Lixisol Bt mixture was conducted in a complete randomized design (CRD). *Tithonia diversifolia* biomass (T) was applied at 5 tonnes (t) dry matter (DM) ha<sup>-1</sup> alone and combined with triple superphosphate (TSP), matongo rock phosphate (MRP) and ammonium sulphate (AS). The results demonstrate that soybean DM, grain yield, nitrogen (N), phosphorus (P) and potassium (K) uptake were higher on pegmatite than on the mixture and the combination of T, TSP and MRP (total: 50 kg P ha<sup>-1</sup> with 70% from MRP and 30% from TSP) which gave higher DM yields compared to the other treatments. The integration of tithonia green manure and different inorganic fertilizers significantly increased the N, P and K uptake by soybean above ground and root biomass versus tithonia alone.